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DISCUSSION

PROFESSOR MARTIN ON THE PERKY EXPERIMENTS

By E. B. TITCHENER

I do not intend to offer here any general criticism of Professor Martin's recent work on imaginal complexes.¹ I am not at all sure that the formation which she terms indifferently 'image of presentation,' 'image of memory,' 'image of recollection,'² is identical with the memory-image of current psychological enquiry; I am not convinced by her analysis of Fechner's after-image of memory;³ and I think that the limits of usefulness of the projection-method must be drawn more narrowly than she has drawn them. On all these points, however, Professor Martin has supported her views by experimental evidence; and I defer their discussion until further experimental evidence, for or against, is forthcoming. It is my present purpose to examine only a small part of her published work,—the experimental series IIb. and IIc., which were undertaken as a test of certain results obtained by Perky in my laboratory.⁴ "The results of these experiments show clearly," says Professor Martin, "that the well-marked differences between image of memory and image of imagination, maintained by Perky on the basis of her experiments, did not exist at any rate for the observers employed in my own experiments."⁵ Here we have experiment set over against experiment; Professor Martin roundly declares that the differences found by Perky did not exist for her observers; so far as these observers are concerned, the negative statement is unqualified. The question naturally arises: What, then, was the nature of Professor Martin's test?⁶ Is it adequate to her conclusion? Has she repeated the Perky experiments under Perky's conditions?—In what follows I try to give an answer to this question.

(1) *The Observers*.—"Any one who has had personal experience in experimental psychology, and especially in its analytical form," writes Professor Martin, "knows how infinitely much, for the results

¹ L. J. Martin, Die Projektionsmethode und die Lokalisation visueller und anderer Vorstellungsbilder, *Zeits. f. Psych.*, lxi., 1912, 321 ff.

² *Op. cit.*, 322, 329, 332, 340, 344 f., 368, 370, etc. The terms are *Vorstellungsbild*, *Gedächtnisbild*, *Erinnerungsbild*.

³ *Ibid.*, 346 ff., 364 ff. In her criticism of my *Thought-processes* Professor Martin appears to have overlooked Ach's explicit reference to Fechner; she has also overlooked Bentley's work on the after-image of memory (N. Ach, *Ueber die Willenstätigkeit und das Denken*, 1905, 11; I. M. Bentley, The Memory Image and its Qualitative Fidelity, this JOURNAL, xi., 1899, 44).

⁴ *Ibid.*, 398 ff.; C. W. Perky, An Experimental Study of Imagination, this JOURNAL, xxi., 1910, 451.

⁵ *Ibid.*, 412.

⁶ Professor Martin states explicitly: "ich beschloss darum, die Bedingungen meiner Experimente denen der Perkyschen Versuche möglichst anzupassen:" *ibid.*, 398.

of an investigation, depends upon the availability of observers who have acquired a true psychological perspective. For such observers guarantee not only an accurate and reliable observation, but also knowledge, and therewith the elimination of fatal forms of suggestion."⁷ The observers in her series IIb. and IIc. were the Misses G., H. and W.,⁸ undergraduate students, two of the 'junior' and one of the 'senior' year; only one (a junior) took a 'major' in Psychology, the other two in History and English.⁹ The observers in Perky's experiments IV ff. were some or all of the following: Drs. Geissler and Pyle, the Misses Clarke, Day, Rand and de Vries (Mrs. Schaub), and Messrs. Nakashima, Tsanoff and Williams.¹⁰ All were graduate students in psychology, and the names of most are familiar to readers of the JOURNAL.

I should be very sorry to have this comparison interpreted as derogatory to Professor Martin's students; I have no doubt that they were skilful and conscientious observers. But if, in new and difficult studies, we attach importance—as I agree with Professor Martin that we must—to psychological training and experience, to 'knowledge' and the 'elimination of suggestion,' then I cannot think that in these two publications the scales are evenly balanced. On the score of 'psychological orientation' as on the score of numbers, the advantage is with Perky.

(2) *The Possibility of Suggestion*.—In the series IIb. Professor Martin's observers "received the instruction to project and to maintain upon the white wall before them, in whichever order they preferred, a visual image of memory and an image of imagination or, conversely, a visual image of imagination and an image of memory. . . . The observers were required to maintain their images of presentation, to compare them, and to base their account upon direct scrutiny and immediate comparison of the two images, and not upon memory." In series IIc. this simultaneous projection of the images was replaced by successive projection, the order being determined by the observers.¹¹

Perky's "observers were left altogether in ignorance of the object of the work." "No one of them, so far as we are aware," Perky declares, "realised that we were in search of a distinction between image of memory and image of imagination. These terms were carefully avoided; the experimenter spoke only of 'image'."¹²

Professor Martin, then, asks explicitly for images of memory and images of imagination; Perky asked simply for images. The former instruction is surely more 'suggestive' than the latter. But, further, Professor Martin made free use of questioning; the questions "were in the main intended to discover whether the observable differences between image of memory and image of imagination were identical

⁷ *Ibid.*, 328.

⁸ *Ibid.*, 399, 412.

⁹ This information was kindly supplied me by the Registrar of the Leland Stanford, Jr., University.

¹⁰ Perky, *op. cit.*, 438 ff.

¹¹ Martin, *op. cit.*, 399, 412.

¹² Perky, *op. cit.*, 437. For the insights gained and the terms employed by the observers, see 439 f. The instruction recorded 442 f. refers to "images of different types," but the terms 'memory' and 'imagination' were not used.

with those reported by Perky.¹³ No less than 13 points were to be established, either by formal instruction or by question and answer: (1) the relative intensities of the two images, in numerical terms; (2) details of origin, course, disappearance; (3) color, magnitude, plasticity, contents; (4) degree and direction of attention; (5) concomitant auditory, kinaesthetic or other secondary images; consequent after-images; (6) observed movements of eyes or body; (7) relative stability of the images; (8) the tendency of the image to self-completion, or of the observer to change or to complete it; (9) the presence of associations; (10) relative pleasantness or unpleasantness; (11) relative realness and naturalness of the images; (12) mobility of the images; and (13) the influence of closure of the eyes.¹⁴ Whether all these points were raised in every observation, and how many of them were included in the formal instruction, how many brought out by questioning, we are not told.

Perky's instructions were very general, and questioning was not employed at all. The observers were required, simply, to give a careful description of the course and character of their images. In special cases, where the conditions of the experiment made it necessary,¹⁵ or where a series of observations was taken with a special purpose,¹⁶ the general instruction was qualified in some particular manner: but at no time were questions put to the observer.¹⁷ Again, then, Professor Martin's work appears to have been more 'suggestive' than our own.

(3) *The Nature of the Task*.—It is clear, from what has been said above, that the task given by Professor Martin is different from that set by Perky to her observers. Professor Martin's students were dealing, from the outset, with images of memory and images of imagination, so named and so distinguished; Perky's observers were dealing solely with 'images,' and worked out their own distinguishing terms as the work proceeded.¹⁸ There is a well-marked qualitative difference in the *Aufgabe* of the two sets of experiments.

Again, however, Professor Martin's observers were required, in the first half of series IIb., to evoke imaginative and memory images of the same object (a vase, a beautiful woman, a book, etc.). To what extent the simultaneously paired images of the second half of this series, and the successively paired images of IIc., were also images of the same object, cannot be precisely determined from the account given.¹⁹ So far, at any rate, as the first half of IIb. is con-

¹³ Martin, *op. cit.*, 399.

¹⁴ *Ibid.*, 399 f.

¹⁵ As in the dark-room experiments with luminous spots, *op. cit.*, 437.

¹⁶ As in the after-image series, *ibid.*, 446.

¹⁷ Note 2, *ibid.*, 444, may seem to contradict this statement; but the contradiction is apparent only. The questions there referred to were put after the conclusion of the work, and the answers represent the general impression of the observers. Indeed, the Note itself implies that the questions were not asked during the experimental series, for the point at issue is left over for further investigation.

¹⁸ E. g., 'particular' and 'generic' *ibid.*, 440.

¹⁹ Martin, *op. cit.*, 399, 412. In the second half of IIb., G. invariably chose the same object for the twofold projection, "presumably for reasons of economy" (404); H. and W. apparently did not,—but numerical data are not given. The results of IIc. are stated in the most general terms.

cerned, we have another qualitative difference of *Aufgabe*. For the stimuli used by Perky were allowed to evoke each its own image, and no attempt was made to parallel an image of memory with a corresponding image of imagination.

Finally, there is a quantitative difference, a difference in the difficulty of the task imposed by the two experimenters. Professor Martin's undergraduate observers are told, at the very beginning of their work, to project and to maintain simultaneously, on the white wall before them, a memory image and an imaginative image of, let us say, a vase. Perky's graduate observers had a far easier task: a stimulus-word was dropped into consciousness by the experimenter, and the observer had merely to report the appearance of imagery (if any imagery appeared), and to describe his experience in his own words. Moreover, Perky's observers were given general preliminary practice and, later, such special practice as change of instruction rendered necessary;²⁰ Professor Martin's students seem—so far as the record goes—to have had no practice at all.²¹ And lastly, the latter observers were required, as we have seen, to pay attention to no less than 13 prescribed points, whereas Perky's graduates were free to describe their images in their own way.

(4) *Voluntary and Spontaneous Production of Imagery*.—"There is undoubtedly a difference," says Professor Martin, "between voluntarily and involuntarily aroused visual images."²² There are undoubtedly, also, differences in the meaning which we may attach to these terms 'voluntary' and 'involuntary.' Thus Professor Martin writes: "in the case of H. the memory image usually cropped up first, as a whole, involuntarily, and localised to the right; . . . an image of imagination rarely appeared involuntarily and as a whole; often a memory image cropped up in its place, and this had then to be changed till H. gained the impression that she had fulfilled instructions and had projected an image of imagination."²³ The distinction here drawn is clear enough. Yet, in the large, all of Professor Martin's images were voluntary, and all of Perky's were involuntary or spontaneous. For H., W. and G. were definitely instructed to project and to maintain images of a particular sort. Perky's observers were, it is true, set for imagery by the terms of the *Aufgabe*; they were asked to be on the look-out for images. They were, however, under no obligation or constraint to produce images; if no image came, of itself, they would so report without sense of failure; and if an image came, they were to "give themselves up" to it; "they were not in any way to control or regulate

²⁰ Perky, *op. cit.*, 435 f., 437.

²¹ Martin, *op. cit.*, 399. Perky remarks (448, note) that the observer V—an observer of what is, in our experience, quite unusual imaginal endowment—had on one occasion a pure fancy image and an indefinite memory image (these terms were not the observer's own!) projected side by side on the same surface. This occurrence, unique in our work, is made by Professor Martin the paradigm of her first method: her undergraduate observers are told, in set terms, to produce and project simultaneously the two sorts of image,—and are able, without further definition, and without preliminary practice, to satisfy the requirement in 4 to 30 sec.!

²² *Ibid.*, 375, 371.

²³ *Ibid.*, 401.

their imagery, but were to give it rein, passively and as association determined."²⁴

(5) *The Data of Observation and their Employment*.—Professor Martin admits, as datum of observation, any imaginal complex whatsoever, provided only that it has been labelled 'memory' or 'imagination' by the observer. Thus, an image of imagination is called for; an image of memory appears; but a voluntary change of magnitude converts it, for the observer, into an image of imagination; and it is accepted as a member of the imaginative class.²⁵

Perky's procedure is different. After distinguishing the two great types of image, she proceeds: "there were, naturally, a fairly large number of intermediate forms (images with personal and place references, but unfixed in time; images with personal reference, but neither temporal nor spatial context; images with context but no personal reference). The classification of these under the one or the other of the two main rubrics would have been possible, from the records, although it would have left a margin of uncertainty, aside from that due to the possibility of an incomplete introspective account. Fortunately, we had no need to attempt it, as the clear-cut cases were sufficiently numerous for our purpose."²⁶ The mixed or intermediate formations are of real psychological interest; but they are not the cases to which we may appeal for the sharp descriptive differentiation of the two types of image; for that purpose we need imaginal complexes which are through and through, and from start to finish, either 'imaginative' or 'memorial.'

It follows, then, that Professor Martin's material is not comparable with that used in our work. Thus, Professor Martin calls for imaginative and memory images of a rose. The observer W. sees a red rose, which she reports as image of memory; thereupon follows the image of a green rose, which is reported as image of imagination. "The two images were alike in all details with the exception of the color."²⁷ To change the form or size or color of a memory image is a short and easy way to produce an image of imagination: and in view of the difficulty of their task I do not wonder that the observers, in all good faith, had recourse to it. I am surprised, however, that Professor Martin, with the Perky results before her, could suppose that observations of this kind were relevant to Perky's conclusions.

²⁴ Perky, *op. cit.*, 435. The instruction on 442 f. is said to have "set up a tendency to alternation;" but, the passage continues, "this tendency was oftentimes cut across by the intrinsic suggestion of the stimulus," with the result that there were 154 memories to 103 imaginations, a ratio of 3:2 and not of 1:1. I doubt if the tendency was ever clearly conscious; I am sure that neither observer intentionally changed or modelled an image in order to force it under the one or the other rubric.

²⁵ Martin, *op. cit.*, 401, 403, 407.

²⁶ Perky, *op. cit.*, 436. I may add that we had intended to discuss, in a second publication, the nature of the mixed forms, and the temporal data (437). The ill-health of the experimenter has made it impossible for her to fulfil this intention. We are now taking up the whole problem afresh, with special reference to Professor Martin's method of projection.

²⁷ Martin, *op. cit.*, 403.

(6) *The Number of Observations.*—Professor Martin's series IIb. contained 50 observations of simultaneous 'doubled images' from each one of 3 observers: 150 observations in all. The number of observations in IIc. (2 observers) is not stated; let us assume that there were, again, 50 for each observer: 100 in all.²⁸ The full tale of observations used to test Perky's results is then 250.

Perky obtained in §2 (kinaesthetic elements) 572 visual images of pure memory and 709 visual images of pure imagination, together with an unnamed number (in fact nearly 200) of mixed forms.²⁹ I omit the auditory and olfactory experiments. In §3 (affective factors) Perky secured 103 pure visual imaginations and 154 pure visual memories.³⁰

Again, then, the advantage is with Perky. Indeed, if I have rightly estimated the length of series IIc., Perky discarded (as mixed or intermediate forms) more observations than Professor Martin took from her three observers in the two test-series combined.

(7) *The Distinction of Memory and Imagination.*—Professor Martin left it to her undergraduate observers to make and to use their own definitions of Memory and Imagination: "the results of our experiment are bound up with the definition (*beziehen sich auf den Begriff*) that as a matter of fact was adopted by the observer."³¹ Perky's observers were never required to frame any definition. Perky found that "a good proportion of the images thus aroused [by verbal stimuli] were of two sharply different kinds." There were images of recognised and particular things, figuring in a particular spatial context, on a particular occasion, and with definite personal reference: these images Perky herself named 'images of memory'; the observers either left them unnamed, or employed such a designative term as 'particular.' There were, on the other hand, images with no determination of context, occasion, or personal reference,—images of things recognised, to be sure, as a hunting-scene, a conflagration, or what not, but not recognised as this or that particular, individual and familiar scene or object: these images Perky named 'images of imagination'; the observers either left them unnamed, or employed such a designative term as 'generic.' It seemed evident that the classificatory terms 'of memory,' 'of imagination,' were justified by current psychological usage; though, in her Summary, Perky warns against generalisation from these fairly simple imaginal complexes to the wider psychology of memory and imagination.³² At any rate, the difference noted was empirical, found in the introspective reports before classification had been at all attempted; and the main body of Perky's investigation is devoted to the introspective differences obtaining between those images which she, as experimenter, had named 'memorial' and those which she, again, had named 'imaginative.' I cannot speak positively for all of Perky's observers; but I can speak for most of them; and it is true of these that not till they read Perky's paper did they learn what their observations had served for,—the introspective differentiation of simple forms of 'memory image' and 'image of imagination.'

²⁸ *Ibid.*, 399, 412.

²⁹ Perky, *op. cit.*, 442.

³⁰ *Ibid.*, 443.

³¹ Martin, *op. cit.*, 413 note.

³² Perky, *op. cit.*, 435 f., 452.

Professor Martin finds that "recognition is the most decisive factor" in the discrimination of memory and imagination.³³ This result accords, so far, with Perky's more highly analytical statement that "a glimpse of this [recognitive] mood could be caught, by alert introspection, at some stage or other in the course of every memory image."³⁴ Professor Martin, however, continues: "It is interesting that in cases where an image was cognised at first as a fancy, and later as a memory image, and conversely, the observer's change of view was not based on the observation of those peculiarities which Perky declares to be characteristic of the two forms of image."³⁵ I have already pointed out that we may not argue directly from images which appear spontaneously to images voluntarily aroused. With this reservation, my comment on the passage is twofold. In the first place, all such changing or dubious images would have been discarded by Perky, on the ground that they did not permit of accurate classification. In the second place, the introspective 'peculiarities' were worked out, in special experimental series, *after* the gross distinction of memory and imagination had been made by the experimenter. Perky's observers had no list of peculiarities, whereby they classified their images; the peculiarities were brought out, so to say, piecemeal, and were grouped and listed by the experimenter; and they were never brought out under the stated rubrics of memory and imagination.

Professor Martin declares that she is surprised, not only by the results of the Perky experiments, but also by their uniformity.³⁶ So were we. She is good enough to add that she has no wish to disparage them:³⁷ but I do not know that facts of observation suffer from disparagement. She has found them sufficiently interesting, as matter of individual psychology, to undertake their experimental testing.³⁸ I have shown above that on the ground of number of observers, training of observers, and number of observations, the test leaves something to be desired. But I have, on my side, no desire to emphasise this criticism; it is always a somewhat unthankful task, when a score of new things are waiting to be done, to turn aside to repeat the work of another investigator; and we are grateful to Professor Martin for the time and pains that she has bestowed upon our work. Unfortunately, as I believe I have shown in detail, the problem which she attacked was not Perky's problem, and the method which she employed was not Perky's method. Until, therefore, the two problems and the two methods have been combined in some synthetic study, and until a correlation has been made out by the comparison of results obtained from the same individuals, it is difficult to say what bearing Professor Martin's observations have on those of Perky, or Perky's conclusions on those of Professor Martin. As things are, the two investigations barely touch.

In conclusion, Professor Martin "disputes my right" to speak of the Perky experiments as I have done in my *Text-book*.³⁹ In the heat of controversy she has here, I think, done an injustice, not

³³ Martin, *op. cit.*, 413 note.

³⁴ Perky, *op. cit.*, 443.

³⁵ Martin, *loc. cit.*

³⁶ ³⁷ ³⁸ *Ibid.*, 413.

³⁹ *Ibid.*, 413.

solely or principally to my book, but more especially to her own wide knowledge of psychology. For she well knows at how many points a psychological system that is based upon experimental results must rely upon a single investigation. I spoke above of the thanklessness of repeating someone else's work; yet sheer repetition, repetition without variation, is again and again the demand of the psychologist who seeks to bring results together. Professor Martin knows, too, that the value of the single investigation depends in large measure upon its power to illuminate a subject, to reconcile conflicting results, to bridge a gap in our general knowledge. Had she viewed Perky's work impartially, and not through the glasses of her own method of projection, I believe that her judgment would have been different, and that her tests would have followed Perky's method rather than her own.⁴⁰ My treatment of the subject in the Text-book is discussed elsewhere.⁴¹

I shall welcome any repetition of Perky's experiments, whether the outcome be positive or negative, confirmation or contradiction. I am ready to extend or to amend the definitions of 'memory image' and 'image of imagination.' Meanwhile, I cannot see that Professor Martin's two experimental series are relevant to the points at issue.

⁴⁰In the present state of experimental psychology, it is surely at least as important to emphasise agreement as to point out difference of results. Yet there is no single passage in Professor Martin's account (*ibid.*, 398-413) in which agreement is mentioned. In fact, when allowance is made for divergence of method, there seem to be a good many observational details which resemble those reported by Perky.

⁴¹See *Memory and Imagination: a Restatement*, *Psychol. Rev.*, xix., 1912, 159 f.